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COMMENTS ON THE DEFINITION OF THE GENUS *DIPLOPAPPUS* CASS. (ASTERACEAE: ASTEREAE)

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ABSTRACT

Diplopappus Cass. (1817), as first defined, comprised two species of *Erigeron* L., two of *Chrysopsis* (Nutt.) Ell. (1824), and one that is likely to be either a species of *Heterotheca* Cass. (1817) or another of *Chrysopsis*. The taxa of *Erigeron* were soon removed from *Diplopappus* by Cassini, but the status of the genus relative to its three other, original, constituent taxa remains unsettled. In any case, *Diplopappus* is based on North American plants and should eventually be treated as a synonym of either *Chrysopsis* or perhaps *Heterotheca*. It is not a synonym of *Aster*, as has sometimes been claimed.

KEY WORDS: *Diplopappus*, *Chrysopsis*, *Aster*, Astereae, Asteraceae

The genus *Diplopappus* Cass. has received a varied and uneven treatment, absorbing many species from a range of genera now recognized to be of widely separated evolutionary affinities. It is now generally relegated to synonymy, although its position and status are not settled. Hooker (*Fl. Bor.-Amer.* 2:20-23. 1834) included a wide range of North American taxa within *Diplopappus*, and Hooker & Arnott (1836) soon expanded the genus further to encompass a large group of South American species now placed primarily in *Haplopappus* DC. In DeCandolle's treatment (*Prodr.* 5:275-278. 1836), *Diplopappus* included species now treated as *Felicia* Cass., *Ionactis* E. Greene, and two groups of *Aster* L. (one from South Africa, one from Asia). Harvey (1865) accepted DeCandolle's concept, in part, but sharply restricted *Diplopappus* to two groups of African species now regarded as *Felicia* and *Aster*. Torrey & Gray (*Fl. N. Amer.* 2:180-184. 1841) included species of *Ionactis* and *Chaetopappa* DC. but expanded the concept of *Diplopappus* in a markedly different direction also to include species of *Doellingeria* Nees and the South

American *Diplostephium* Kunth. Gray (1884) later completely dismantled North American *Diplopappus* and distributed its accumulated taxa through a number of genera, including (as now recognized) *Aster*, *Chaetopappa*, *Ionactis*, *Erigeron* L., *Heterotheca* Cass., *Chrysopsis* (Nutt.) Ell., *Pityopsis* Nutt., *Corethrogyne* DC., and *Machaeranthera* Nees.

The early usage of *Diplopappus* beyond Cassini, however, moved far from its original conception. In a brief but apparently legitimate, initial publication of *Diplopappus* (1817), Cassini did not treat any specifically designated species, but two years later (*Dict. Sci. Nat.* 39:103. 1819) he formally included five species. Two of these were taxa now placed in the North American genus *Chrysopsis*, two now placed as North and Central American species of *Erigeron*, and the identity of the other (*Diplopappus villosus* Cass.) remains uncertain, although it may be *Heterotheca* (see below).

Diplopappus Cass., Bull. Sci. Soc. Philom. Paris 1817:137. 1817. SYNTYPES (*Dict. Sci. Nat.* 39:103. 1819):

Diplopappus lanatus Cass. (= *Chrysopsis gossypina* [Michx.] Ell.);

Diplopappus intermedius Cass. (= probably *Chrysopsis gossypina*);

Diplopappus dubius Cass. (= *Erigeron annuus* [L.] Pers.);

Diplopappus delphinifolius Cass. (= *Erigeron delphinifolius* Willd.);

Diplopappus villosus Cass. (? = *Heterotheca villosa* [Pursh] Shinners.

The two species of *Erigeron* were later excluded by Cassini himself in favor of positions in other genera, and they also were formally excluded in the treatment by DeCandolle, who also referred them to other genera. *Diplopappus* can reasonably be rejected as a synonym of *Erigeron* (Nesom 1989). Semple (1981) listed *Diplopappus* Cass. as a synonym of *Chrysopsis* in his revisional treatment of the latter; he indicated without explanation that *Diplopappus* is a "*nom. illeg.*" He included *D. lanatus* Cass. as a synonym of *C. gossypina*, probably based on Cassini's own treatment of *C. gossypina* as a synonym of *D. lanatus*, but he did not provide an identity for *D. intermedius* Cass. According to Cassini (1819), however, the latter differs very little from *D. lanatus*, and *Index Kewensis* (probably on the basis of Cassini's comment) indicates that it perhaps is a synonym of *C. gossypina*.

With regard to *Diplopappus villosus*, Cassini (*Dict. Sci. Nat.* 13:309. 1819) noted that "Nous ignorons la patrie de cette plante, que nous avons etudiee dans l'herbier de M. de Jussieu, ou elle est etiquetee, par erreur san doute, *Aster alpinus* B, Linn." Cassini described this plant as herbaceous, highly branched, with alternate, sessile, lanceolate-acute, entire leaves villous or velutinous ("velues") on both surfaces, with yellow flowers in heads in a corymbiform panicle, achenes obovate and flat, with an outer series of short, flat

squamellae and inner series of barbellate bristles. Its identity remains unclear, and I have been unable to locate in the Jussieu herbarium (on fiche) a specimen that might correspond to Cassini's description, but it may yet be found there. In any case, the specimen was collected by Michaux (*fide* Cassini) and almost certainly came from North America. Based on Cassini's description, its assignment to *Chrysopsis* or *Heterotheca* sect. *Phyllotheca* (Nutt.) V. Harms (see Semple 1987) seems reasonable.

Both Farr *et al.* (1979) and Heywood *et al.* (1977) positioned *Diplopappus* as a synonym of *Aster* L., these opinions probably reflecting the association of the name *Diplopappus* with South African asters. The problematic identity of these species with *Diplopappus*, however, has been noted or discussed in relatively recent literature (Merxmüller 1954; Grau 1973; Dyer 1975). Jeffrey (1990) also placed *Diplopappus* as a synonym of *Aster* L., but he noted that the three "syntype species" are from North America. *Aster* in any sense, however, could be regarded as incorporating *Diplopappus* only if the identity of *D. villosa* Cass. were established as an *Aster* and that taxon chosen as the lectotype of *Diplopappus*. *Diplopappus villosus* certainly is not any species of *Aster* sensu lato if Cassini's description of "fleurs jaunes" is accurate and applies to both ray and disc flowers. DeCandolle (1836), however, specifically noted that he separated the genus *Chrysopsis* from *Diplopappus* on the basis of yellow rays in the former, and, in fact, the only treatment of *Diplopappus* since Cassini's to include yellow-rayed taxa has been that of Hooker & Arnott. DeCandolle's treatment of *Diplopappus* included none of the five species first placed there by Cassini.

If *Diplopappus* were lectotypified with one of the two species that seem clearly to be *Chrysopsis*, Cassini's generic name would have priority over that of Ellis: (*Chrysopsis* [Nutt.] Ell. 1824, based on *Inula* sect. *Chrysopsis* Nutt. 1818). Hooker (*Fl. Bor.-Amer.* 2:22. 1834) treated *Chrysopsis* within *Diplopappus* Cass. and included *D. villosus* as one of the species, listing in its synonymy *Chrysopsis villosa* (Pursh) Nutt. (= *Heterotheca villosa* [Pursh] Shinners). Hooker did not provide a citation of authorship for *D. villosus*, although its listing from that reference in *Index Kewensis* implied that the authorship was intended to be *D. villosa* (Pursh) Hook., in contrast to *D. villosus* Cass. *Diplopappus villosus* Hook. & Arn. (Companion Bot. Mag. 2:48. 1836) is a taxon now treated as a South American species of *Hysterionica* Less. and is heterotypic with the North American homonyms.

If the identity of *Diplopappus villosus* Cass. were established as a synonym of *Heterotheca villosa* (Pursh) Shinners, as seems possible, *Diplopappus* could be treated simply as a synonym of *Heterotheca* Cass., which was established as the next genus following *Diplopappus* in Cassini's 1817 paper. As pointed out by Dr. Semple, however, in his comments on this paper, Michaux could not have collected *H. villosa* in eastern North America, and plants of that species hardly fit the description of "highly branched." Further, species of *Chrysopsis*

are variable in the amount of indument produced, often giving them a markedly different aspect, and it is possible that Cassini's *D. villosus* was based on yet another plant of *Chrysopsis*. The location of Cassini's type (the Michaux specimen in the Jussieu herbarium) and its identification as *Heterotheca* would provide the simplest solution. Otherwise, it may ultimately become necessary to lectotypify *Diplopappus* with *D. lanatus* and then to conserve *Chrysopsis*, a genus already once conserved (over an earlier generic name of Rafinesque: see *ICBN* 1972 and Semple 1981).

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